

WHAT IS CLAIMED IS:

1. A toner supply device for supplying toner to a surface of an electrostatic transport member which carries the toner with an electrostatic force to a developing position facing a latent image carrying member and develops a latent image on the latent image carrying member by the toner, comprising

receiving means for receiving a mixture of toner composed of toner particles and a friction facilitating material composed of friction facilitating particles of an average particle diameter greater than an average particle diameter of the toner particles;

agitating and carrying means for agitating and carrying the mixture of the toner and the friction facilitating material in the receiving means; and

a mesh having plural openings for communicatively connecting inside and outside of the receiving means therethrough, the shortest diameter portion of the openings of the mesh being greater than the average particle diameter of the toner particles and smaller than the average particle diameter of the friction facilitating particles,

wherein the toner particles in the mixture are discharged from the openings of the mesh and supplied to the surface of the electrostatic transport member.

2. A toner supply device according to Claim 1, wherein: a predetermined material is designated as the toner suitable for use; and

the shortest diameter portion of the openings of the mesh has a size sufficient for allowing passage of 80% or more toner particles in the toner having a particle diameter distribution.

3. A toner supply device according to claim 1, wherein:

a predetermined material is designated as the friction facilitating material suitable for use; and

the shortest diameter portion of the openings of the mesh has a size sufficient for preventing passage of 80% or more friction facilitating particles in the friction facilitating material having a particle diameter distribution.

4. A toner supply device according to claim 1, wherein each of the openings of the mesh is in the form of a non-perfect circle and has a long diameter of the portion and a short diameter portion.

5. A toner supply device according to claim 4, wherein the openings of the mesh are disposed in a posture in which a longitudinal direction thereof is along a direction perpendicular to a carrying direction of the agitating and carrying means.

6. A toner supply device according to claim 1, wherein the agitating and carrying means carries the mixture in a rotation axial direction in accordance with rotation of a rotation member having a rotation shaft and a spiral projection protrudingly provided in a spiral shape on a surface of the rotation shaft.

7. A toner supply device according to claim 6, wherein the spiral projection is a brush composed of plural raisings.

8. A toner supply device according to claim 1, wherein a material, composed of friction facilitating particles containing a nonmagnetic material is designated as the friction facilitating material suitable for use.

9. A toner supply device according to claim 1, wherein a material composed of friction facilitating particles containing a single material is designated as the friction facilitating material suitable for use.

10. A toner supply device according to claim 1, wherein a material composed of friction facilitating particles containing two or more materials is designated as the friction facilitating material suitable for use.

11. A toner supply device according to claim 10, wherein a material composed of friction facilitating particles with a surface layer coated over a core material is designated as the friction facilitating material

suitable for use.

12. A toner supply device according to claim 1, wherein the agitating and carrying means comprises plural flat members provided in positions different from one another in an axial direction of a main shaft on a peripheral surface of the main shaft.

13. A toner supply device according to claim 12, wherein triangular projections are formed on surfaces of the flat members of the agitating and carrying means.

14. A toner supply device according to claim 12, wherein:

plural rib members are provided in different positions in the axial direction in parts of the main shaft where the flat members are not provided; and

triangular projections are formed on surfaces of the rib members.

15. A toner supply device according to claim 12, wherein the agitating and carrying means agitates the toner and the friction facilitating material with a butterfly system or a pendulum system.

16. A toner supply device according to claim 1, wherein the agitating and carrying means has a brush structure.

17. A toner supply device according to claim 16, wherein the agitating and carrying means is in contact with

the mesh.

18. A toner supply device according to claim 1, wherein a charging functional material is formed on a surface of the agitating and carrying means.

19. A toner supply device according to claim 1, wherein a charging functional material is formed on an inner surface of an agitation tank in which the agitating and carrying means is arranged.

20. A developing device for developing a latent image formed on a latent image carrying member, comprising:

an electrostatic transport member for carrying toner on a surface thereof with an electrostatic force to a developing position facing the latent image carrying member; and

toner supply means for supplying the toner to the surface of the electrostatic transport member,

wherein the toner carried to the developing position is adhered to the latent image on the latent image carrying member to develop the latent image,

the toner supply means comprising:

receiving means for receiving a mixture of toner composed of toner particles and a friction facilitating material composed of friction facilitating particles of an average particle diameter greater than an average particle diameter of the toner particles;

agitating and carrying means for agitating and carrying the mixture of the toner and the friction facilitating material in the receiving means; and

a mesh having plural openings for communicatively connecting inside and outside of the receiving means therethrough, the shortest diameter portion of the openings of the mesh being greater than the average particle diameter of the toner particles and smaller than the average particle diameter of the friction facilitating particles,

wherein the toner particles in the mixture are discharged from the openings of the mesh and supplied to the toner electrostatic transport member.

21. A developing device according to claim 20, further comprising recycling means for recycling toner which has passed the developing position without contributing the development on the surface of the electrostatic transport, into the receiving means .

22. An image forming apparatus comprising:

a latent image carrying member for carrying a latent image;

a developing device for developing the latent image by carrying toner on a surface of an electrostatic carrying member with an electrostatic force to a developing position facing the latent image carrying member; and

toner supply means for supplying the toner to the surface of the electrostatic transport member,

the toner supply means comprising:

receiving means for receiving a mixture of toner composed of toner particles and a friction facilitating material composed of friction facilitating particles of an average particle diameter larger than an average particle diameter of the toner particles;

agitating and carrying means for agitating and carrying the mixture of the toner and the friction facilitating material in the receiving means; and

a mesh having plural opening for communicatively connecting inside and outside of the receiving means therethrough, the shortest diameter portion of the opening of the mesh being greater than the average particle diameter of the toner particles and smaller than the average particle diameter of the friction facilitating particles,

wherein the toner particles in the mixture are discharged from the openings of the mesh and supplied to the surface of the toner electrostatic transport member.

23. An image forming apparatus according to claim 22, further comprising discharge facilitating means for facilitating discharge of the toner from the openings separately from the agitating and carrying means.

24. An image forming apparatus according to claim 23, wherein the discharge facilitating means comprises potential difference generating means for generating a potential difference between the mesh and the toner electrostatic transport member.

25. An image forming apparatus according to claim 23, wherein the discharge facilitating means comprises:

an electrode member disposed between the mesh and the toner electrostatic transport member; and

potential difference generating means for generating a potential difference between the mesh and the electrode member.

26. An image forming apparatus according to claim 23, wherein the discharge facilitating means comprises vibration generating means for vibrating the mesh.

27. An image forming apparatus according to claim 23, wherein the discharge facilitating means is caused to function at least when the toner is carried by the toner electrostatic transport member.

28. An image forming apparatus according to claim 22, wherein the surface of the toner electrostatic transport member is coated with a protective layer.